

ABSTRACT

An internal combustion engine includes a throttle controlling mechanism; a valve characteristic varying mechanism which controls an internal EGR rate by the control of an overlap period P_a and a non-overlap period P_b ; and an output setting means which sets a required amount of engine output. The throttle controlling mechanism controls an opening degree of a throttle valve to fully open the throttle valve at a predetermined load D_a with an increase in an operating amount D in a first load range F_a which covers load range below the predetermined load D_a in a low-load range, and to keeps the throttle valve fully opened in a second load range F_b which covers a load range over the predetermined load D_a . The valve characteristic varying mechanism controls the engine output by controlling the overlap period P_a or the non-overlap period P_b according to the required amount D over the entire load range, and controls valve operation characteristics to obtain a maximum internal EGR rate at the predetermined load D_a .